

WHAT IS CLAIMED IS:

1. A loop filter for receiving a control current and generating a control voltage,
the loop filter comprising:
 - a first resistor having a first terminal and a second terminal, the first
5 terminal receiving the control current;
 - a capacitor connected to the second terminal of the first resistor;
 - a second resistor having a first terminal and a second terminal, the first
terminal being connected to the first terminal of the first resistor;
 - a compensating unit for generating a compensating voltage and having a
10 first terminal and a second terminal, the first terminal being connected
to the second terminal of the second resistor;
 - an OP amplifier having an output terminal connected to the second terminal
of the second resistor, a first input terminal connected to the second
terminal of the first resistor, and a second input terminal connected to
15 the second terminal of the compensating unit; and
 - a current source connected to the second terminal of the compensating unit
to provide a compensating current to the compensating unit;
 - wherein the voltage of the output terminal of the OP amplifier substantially
equal to that of the first input terminal of the OP amplifier.
- 20 2. The loop filter according to claim 1, further comprising:
 - a voltage slew rate detector for detecting a voltage slew rate of the output
terminal of the OP amplifier; and
 - a deciding unit for controlling the value of the compensating current of the

current source according to the voltage slew rate.

3. The loop filter according to claim 1, wherein the compensating unit is a resistor.
4. The loop filter according to claim 1, further comprising a fourth resistor,
5 wherein the control current flows first through the fourth resistor such that the resistances of the first resistor and the second resistor is reduced.
5. The loop filter according to claim 1, wherein the first input terminal of the OP amplifier is a positive terminal, and the second input terminal of the OP amplifier is a negative terminal.
- 10 6. The loop filter according to claim 5, wherein the current of the current source flows out of the second terminal of the compensating unit.
7. The loop filter according to claim 5, wherein the current of the current source flows into the second terminal of the compensating unit.
8. The loop filter according to claim 1, wherein the loop filter is used in a
15 phase locked loop.
9. A method for adjusting a compensating current of a loop filter in a phase locked loop to make a control voltage stable, the loop filter having a charge/discharge path, a second resistor, an OP amplifier connected to the charge/discharge path and the resistor for outputting a control voltage, a
20 compensating unit connected to an output and a second input terminals of the OP amplifier, and a current source connected to the compensating unit for providing a compensating current, the charge/discharge path and the second resistor receiving a control current, the method comprising the steps

of:

closing the loop of the phase locked loop and obtaining the control voltage;

opening the loop of the phase locked loop;

measuring a slew rate of the control voltage;

- 5 completing the adjustment if an absolute value of the slew rate is smaller
 than a voltage threshold;

reducing the compensating current and repeating the steps when the slew
rate is greater than 0 and the second input terminal of the OP
amplifier is a negative terminal, or the slew rate is smaller than 0 and

- 10 the second input terminal of the OP amplifier is a positive terminal;
 and

increasing the compensating current and repeating the steps when the slew
rate is smaller than 0 and the second input terminal of the OP
amplifier is a negative terminal, or the slew rate is greater than 0 and

- 15 the second input terminal of the OP amplifier is a positive terminal.